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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/762,985

Applicant(s)

BECKER ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 31-60 is/are pending in the application.
- 4a) Of the above claim(s) 31-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 42-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.

- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: _____                                    |

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### **DETAILED ACTION**

In the response to the restriction requirement, applicant's representative correctly indicated that claims 1-30 were cancelled and newly claims 31-60 were added by a preliminary amendment. Upon reviewing the file of the application, such preliminary amendment, filed on February 15, 2001, was found and entered, and therefore, claims 31-60 are now pending in the application. Furthermore, as correctly pointed out by the applicant's representative, the newly added claims are restrictable in the same way as the originally filed claims.

### ***Election/Restrictions***

Applicant's election with traverse of group II in Paper No. 6 is acknowledged. The traversal is on the ground(s) that according to PCT rules, a process and an apparatus specifically defined for carrying out the process are required to be examined together. This is not found persuasive because they do not relate to a single general inventive concept and lack the same or corresponding special technical features and therefore are restrictable as pointed out by the examiner in the restriction requirement mailed 4-24-02.

The requirement is still deemed proper and is therefore made FINAL.

Furthermore, it should be noted that although there is nothing improper per se about having claim 42 depending from claim 31, if claim 31 which is non-elected is later canceled it will then be improper. It is strongly advised that claim 42 be rewritten in independent form so the claim can stand by itself.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 45 and 47-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 45-line 4, claim 47-line 2, claim 50-line 2, claim 51-line 3, claim 52-line 3, and claim 53-lines 2 and 4, recite broad recitations, and each of the claims also recite narrower statements of the range/limitation, thus rendering the claims indefinite.

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Claim 54 recites the limitation "the pulsing of the magnetic field" in line 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 42-43, 47, and 50 are rejected under 35 USC 102(b) as being anticipated by Kadomura, U.S. Patent 5,662,819.

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Kadomura shows the invention as claimed including including a method for etching a silicon body substrate using an inductively coupled plasma comprising: an ICP source 66 for generating a radio-frequency electromagnetic alternating field, a reactor (51,57) for generating the inductively coupled plasma from reactive particles by the action of the radio-frequency electromagnetic alternating field on a reactive gas, and a first means for generating plasma power pulses (see abstract) to be injected into the inductively coupled plasma by the ICP source, the method comprising the step of injecting a pulsed radio-frequency power into the inductively coupled plasma as a pulsed plasma power (see figs. 4-6 and their description).

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With respect to claim 43, the pulsed plasma power is injected via an ICP source to which a radio-frequency electromagnetic alternating field having a constant frequency is applied around a stationary frequency.

Concerning claim 47, Kadomura discloses generating a pulsed magnetic field, the direction of which is at least approximately or predominantly parallel to a direction defined by the connecting line of the substrate and the inductively coupled plasma.

Regarding claim 50, a pulsed radio frequency power is applied to the substrate via a substrate voltage generator.

Claims 42-43, 50, 54, and 57 are rejected under 35 USC 102(b) as being anticipated by Savas, WO 97/14177.

Savas shows the invention as claimed including a method for etching a silicon body substrate using an inductively coupled plasma comprising: an ICP source (150a, 150b) for generating a radio-frequency electromagnetic alternating field, a reactor 100 for generating the inductively coupled plasma from reactive particles by the action of the radio-frequency electromagnetic alternating field on a reactive gas, and a first means for generating plasma power pulses to be injected into the inductively coupled plasma by the ICP source, the method comprising the step of injecting a pulsed radio-frequency power into the inductively coupled plasma as a pulsed plasma power (see fig. 1 and page 6, line 10 to page 13, line 19).

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With respect to claim 43, the pulsed plasma power is injected via an ICP source to which a radio-frequency electromagnetic alternating field having a constant frequency is applied around a stationary frequency.

Concerning claim 50, the pulsed radio frequency power 152 is applied to the substrate via a substrate voltage generator.

With respect to claims 54 and 57, note that a frequency of 13.56 MHz is used and the pulse to pause ratio of the injected radio-frequency pulses is at least greater than 1:1, and the pulses are applied simultaneously (see page 9, lines 1-28).

Claims 42-43, 50, 54, and 56-58 are rejected under 35 USC 102(e) as being anticipated by Koshimizu, U.S. Patent 5,935,373.

Koshimizu shows the invention as claimed including a method for etching a silicon body substrate using an inductively coupled plasma comprising: an ICP source 118 for generating a radio-frequency electromagnetic alternating field, a reactor 102 for generating the inductively coupled plasma from reactive particles by the action of the radio-frequency electromagnetic alternating field on a reactive gas, and a first means for generating plasma power pulses 154 to be injected into the inductively coupled plasma by the ICP source, the method comprising the step of injecting a pulsed radio-frequency power into the inductively coupled plasma as a pulsed plasma power (see figs. 1-3B and their description).

With respect to claim 43, the pulsed plasma power is injected via an ICP source to which a radio-frequency electromagnetic alternating field having a constant frequency is applied around a stationary frequency.

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Regarding claim 50, a pulsed radio frequency power is applied to the substrate via a substrate voltage generator.

Concerning claim 54, the pulsing of the injected plasma power and the pulsing of the radio-frequency power injected into the substrate via the substrate voltage generator are time-correlated or synchronized with each other.

Furthermore, with respect to claims 56-58, the correlation takes place so that during a portion of the time in which the power pulse of the ICP generator is switched on, the radio-frequency power injected to the substrate is switched off, and the correlation also takes place so that during a portion of the time in which the radio-frequency power pulse is injected to the substrate, the power injected to the ICP generator is switched off. Additionally, during another portion of the time the power pulse to the ICP generator or the RF power injected to the substrate is turned on, the RF power and ICP generator, respectively, are also on. Also, the radio frequency power applied to the substrate can be generated during a power rise of a radio frequency power pulse injected into the plasma via the ICP coil generator.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 44-45 and 48-49 are rejected under 35 USC 103 as being obvious over Kadomura, U.S. Patent 5,662,819.

Kadomura is applied as above but fails to expressly disclose 1) wherein the pulsed radio-frequency power is generated with an ICP coil generator which is pulse-operated with a frequency of 10 Hz to 1 MHz and pulse to pause ratio of 1:1 to 1:100 2) wherein a plasma power of 300 watts to 5000 watts on the time average is injected into the inductively coupled plasma and that the generated individual pulse powers of the radio-frequency power pulses are between 300 watts and 20 kilowatts 3) wherein the magnetic field is generated in such a way that it extends into the area of the substrate and the inductively coupled plasma and has a field strength amplitude of between 10MTesla and 100mTesla in the interior of the reactor, and 4) wherein a magnetic field pulsed at a frequency of 10Hz to 20kHz is generated via the power supply unit, the pulse to pause ratio when the magnetic field is pulsed being between 1:1 and 1:100.

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With respect to processing parameters such as the particular pulse length, power, and frequency of the RF waves as well as parameters of the magnetic field, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum values of these parameters based upon a variety of factors including the desired strength of the plasma, and would not lend patentability to the instant application absent the showing of unexpected results.

Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadomura, U.S. Patent 5,662,819 in view of Koshimizu, U.S. Patent 5,997,687.

Kadomura is applied as above but fails to expressly disclose wherein the pulsing of the radio-frequency power is accompanied by a change of the frequency of the injected radio-frequency power, the frequency change being controlled in such a way that the plasma power injected into the inductively coupled plasma during the pulsing is maximized. Koshimizu discloses shifting the frequency higher during pulse plasma processing to enhance the ignition of the plasma (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kadomura so as to shift the frequency of the pulses higher as suggested by Koshimizu in order to improve the ignition of the plasma.

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Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadomura, U.S. Patent 5,662,819 in view of Laermer et al., U.S. Patent 5,501,893.

Kadomura is applied as above but fails to expressly disclose wherein the etching takes place in alternating etching and passivation steps at a process pressure of 5 microbars to 100 microbars. Laermer et al. discloses performing alternating etching and passivation steps at a process pressure of 10 to 100 microbars (see fig. 1 and col. 4-line 23 to col. 5-line 65). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kadomura so as to perform the etching process of Laermer et al. because this is a suitable process to be performed in a plasma etching apparatus.

Claims 44-45, 51-53, 56, and 58-59 are rejected under 35 USC 103(a) as being unpatentable over Savas, WO 97/14177.

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Savas is applied as above but fails to expressly disclose 1) wherein the pulsed radio-frequency power is generated with an ICP coil generator which is pulse-operated with a frequency of 10 Hz to 1 MHz and pulse to pause ratio of 1:1 to 1:100 2) wherein a plasma power of 300 watts to 5000 watts on the time average is injected into the inductively coupled plasma and that the generated individual pulse powers of the radio-frequency power pulses are between 300 watts and 20 kilowatts 3) wherein the pulse duration of the radio-frequency power injected into the substrate is between one to one hundred times, one to ten times in particular, the period of oscillation of the high-frequency fundamental component of the radio-frequency power 4) wherein the radio-

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frequency power applies a time-average power of 5 watts to 100 watts to the substrate, the maximum power of an individual radio-frequency power pulse being one to twenty times, the time average power 5) wherein the correlation takes place in such a way that during a radio-frequency power pulse of the ICP generator, the radio-frequency power injected into the substrate via the substrate voltage generator is switched off and/or that during a radio frequency power pulse injected into the substrate via the substrate voltage generator, the radio-frequency power injected via the ICP coil generator is switched off 6) where both limitations 4 and 5 occur and 7) where the radio frequency injected into the substrate is generated during a power rise or power drop of a radio frequency power pulse injected into the plasma via the ICP coil.

With respect to processing parameters such as the particular pulse length, power, and frequency of the RF waves as well as the synchronization between the antenna and substrate pulses, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum values of these parameters based upon a variety of factors including the desired strength of the plasma, and would not lend patentability to the instant application absent the showing of unexpected results.

Claim 46 is rejected under 35 USC 103(a) as being unpatentable over Savas, WO 97/14177 in view of Koshimizu, U.S. Patent 5,997,687.

Savas is applied as above but fails to expressly disclose wherein the pulsing of the radio-frequency power is accompanied by a change of the frequency of the injected

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radio-frequency power, the frequency change being controlled in such a way that the plasma power injected into the inductively coupled plasma during the pulsing is maximized. Koshimizu discloses shifting the frequency higher during pulse plasma processing to enhance the ignition of the plasma (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Savas so as to shift the frequency of the pulses higher as suggested by Koshimizu in order to improve the ignition of the plasma.

Claim 60 is rejected under 35 USC 103(a) as being unpatentable over Savas, WO 97/14177 in view of Laermer et al., U.S. Patent 5,501,893.

Savas is applied as above but fails to expressly disclose wherein the etching takes place in alternating etching and passivation steps at a process pressure of 5 microbars to 100 microbars. Laermer et al. discloses performing alternating etching and passivation steps at a process pressure of 10 to 100 microbars (see fig. 1 and col. 4-line 23 to col. 5-line 65). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Savas so as to perform the etching process of Laermer et al. because this is a suitable process to be performed in a plasma etching apparatus.

Claims 47-49 and 55 are rejected under 35 USC 103(a) as being unpatentable over Savas, WO 97/14177 in view of LyMBERopoulos et al., U.S. Patent 6,085,688.

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Savas is applied as above but fails to expressly disclose a pulsed magnetic field and the parameters of the magnetic field as claimed along with the applying the magnetic field first, before a radio frequency power pulse of the ICP generator, and the magnetic field is switched off again after the decay of the radio-frequency power pulse.

Lymberopoulos et al. discloses applying a pulsed magnetic field in an area of the substrate and perpendicular to a line between the substrate and an ICP source in order to control the plasma (see figs. 5, 10-13, and abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Savas to apply a pulsed magnetic field as taught by Lymberopoulos et al. because the pulsed magnetic field can be used to selectively control plasma density or to selectively confine process gas species (see last two lines of abstract).

With respect to processing parameters such as the strength of the magnetic field and frequency of the pulses of the magnetic field as well as the synchronization of the magnetic and antenna pulses, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum values of these parameters based upon a variety of factors including the desired strength of the plasma, and would not lend patentability to the instant application absent the showing of unexpected results.

Claims 44-45, 51-53, and 59 are rejected under 35 USC 103(a) as being unpatentable over Koshimizu, U.S. Patent 5,935,373.

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Koshimizu is applied as above but fails to expressly disclose: 1) wherein the pulsed radio-frequency power is generated with an ICP coil generator which is pulse-operated with a frequency of 10 Hz to 1 MHz and pulse to pause ratio of 1:1 to 1:100 2) wherein a plasma power of 300 watts to 5000 watts on the time average is injected into the inductively coupled plasma and that the generated individual pulse powers of the radio-frequency power pulses are between 300 watts and 20 kilowatts 3) wherein the pulse duration of the radio-frequency power injected into the substrate is between one to one hundred times, one to ten times in particular, the period of oscillation of the high-frequency fundamental component of the radio-frequency power 4) wherein the radio-frequency power applies a time-average power of 5 watts to 100 watts to the substrate, the maximum power of an individual radio-frequency power pulse being one to twenty times, the time average power 5) wherein the frequency of the injected radio-frequency power is between 100 kHz to 100 MHz, and that the pulse to pause ratio of the injected radio-frequency pulses is between 1:1 and 1:100, and 6) wherein the correlation takes place in such a way that during the time of the plasma power pulses injected into the plasma via the ICP coil generator and during the time of the pulse pauses between the individual plasma power pulses injected into the plasma via the ICP coil generator, at least one radio-frequency power pulse injected into the substrate via the substrate voltage generator is applied to the substrate in each case.

With respect to processing parameters such as the particular pulse length, power, frequency of the RF waves, and synchronization between the antenna and substrate pulses, it would have been obvious to one of ordinary skill in the art at the

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time the invention was made to determine through routine experimentation the optimum values of these parameters based upon a variety of factors including the desired strength of the plasma, and would not lend patentability to the instant application absent the showing of unexpected results.

Claim 46 is rejected under 35 USC 103(a) as being unpatentable over Koshimizu, U.S. Patent 5,935,373 in view of Koshimizu, U.S. Patent 5,997,687.

Koshimizu, U.S. Patent 5,935,373 is applied as above but fails to expressly disclose wherein the pulsing of the radio-frequency power is accompanied by a change of the frequency of the injected radio-frequency power, the frequency change being controlled in such a way that the plasma power injected into the inductively coupled plasma during the pulsing is maximized. Koshimizu '687 discloses shifting the frequency higher during pulse plasma processing to enhance the ignition of the plasma

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(see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Koshimizu '373 so as to shift the frequency of the pulses higher as suggested by Koshimizu '687 in order to improve the ignition of the plasma.

Claim 60 is rejected under 35 USC 103(a) as being unpatentable over Koshimizu, U.S. Patent 5,935,373 in view of Laermer et al., U.S. Patent 5,501,893.

Koshimizu is applied as above but fails to expressly disclose wherein the etching takes place in alternating etching and passivation steps at a process pressure of 5



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microbars to 100 microbars. Laermer et al. discloses performing alternating etching and passivation steps at a process pressure of 10 to 100 microbars (see fig. 1 and col. 4-line 23 to col. 5-line 65). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Koshimizu so as to perform the etching process of Laermer et al. because this is a suitable process to be performed in a plasma etching.

Claims 47-49 and 54-55 are rejected under 35 USC 103(a) as being unpatentable over Koshimizu, U.S. Patent 5,935,373 in view of Lymberopoulos et al., U.S. Patent 6,085,688.

Koshimizu is applied as above but fails to expressly disclose a pulsed magnetic field and the parameters of the magnetic field as claimed along with the applying the magnetic field first, before a radio frequency power pulse of the ICP generator, and the magnetic field is switched off again after the decay of the radio-frequency power pulse.

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Lymberopoulos et al. discloses applying a pulsed magnetic field in an area of the substrate and perpendicular to a line between the substrate and an ICP source in order to control the plasma (see figs. 5, 10-13, and abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Koshimizu to apply a pulsed magnetic field as taught by Lymberopoulos et al. because the pulsed magnetic field can be used to selectively control plasma density or to selectively confine process gas species (see last two lines of abstract).

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With respect to processing parameters such as the strength of the magnetic field and frequency of the pulses of the magnetic field as well as the synchronization of the magnetic and antenna pulses, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum values of these parameters based upon a variety of factors including the desired strength of the plasma, and would not lend patentability to the instant application absent the showing of unexpected results.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Luz L. Alejandro  
Patent Examiner  
Art Unit 1763

February 24, 2003